799 Profitability and milk yield response to protein supplementation in mid-lactation dairy cows. A. E. O. Malau-Aduli* and J. C. Beattie, *School of Agricultural Science, University of Tasmania*, *Hobart, Tasmania, Australia*.

This study utilized 120 Holstein-Friesian dairy cows in mid-lactation in a randomized block experimental design. The aim was to evaluate milk yield and composition responses to protein supplementation and profitability over an eight-week lactation period. The cows were blocked according to milk yield, days in milk and parity before being randomly assigned to three treatment groups: Control, 15% and 30% protein supplementation. Weekly average daily milk yield (WMY), total milk yield (TMY), income from milk sales, profitability, fat and protein percentages were subjected to statistical analyses to test the effects of treatment, block, parity, week and their second order interactions fitting days in milk as a random effect in mixed model procedures. Multiple regressions with quadratic contrasts were fitted to predict income and profitability from total ration fed and days in milk. The 30% protein supplemented cows gave the highest milk responses (WMY, 27.1 ± 0.80; TMY, 1479.9 ± 38.01litres), fat percentage (2.6 ± 0.3%), total income ($597.4 ± 40.23) and profitability ($54.4 ± 5.04 per cow), while the control group gave the least responses and incurred a loss of -$24.30 ± 4.95. Third parity cows also gave the highest milk yield responses (WMY, 28.1 ± 0.51; TMY 1562.1 ± 28.24 litres) and profitability ($65.7 ± 15.37). Residual phenotypic correlations (r) between milk yield, composition and profitability were almost all highly significant (P<001) with the highest positive r=0.96 between WMY and TMY. Total ration and days in milk within treatment group alone were very poor predictors of profitability (r^2=0.02-0.12) compared to within parity groups (r^2=0.14-0.90) for income, WMY and TMY. It was concluded that even though a positive profit margin was evident, long-term feeding of mid-lactation cows with 30% protein supplement is unrealistic because of the prohibitive cost of protein. Furthermore, protein requirements for milk synthesis at this stage of lactation can be adequately met by a 16-17% protein diet since energy would be the most limiting nutrient.

Key Words: protein supplementation, milk yield response, profitability